Data Warehouse Project Overview

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Data Warehouse Project

- Why do we need national-level data?
- Why a DW?
- Design features of a DW environment
- Phase 1 – the Pilot Data Warehouse
- Next phase – DW-1

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Why Do We Need National Data?

- Requests for information are ever increasing
- These ever increasing requests will likely continue
- But our resources will not increase commensurate to these increased demands

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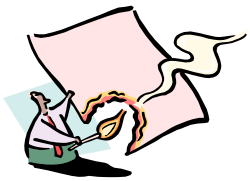
Why Do We Need National Data?



- By deriving information from existing data, data that are already being collected for other purposes,

we can reduce local data collection burdens and bureaucratic overhead at all levels

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Why Do We Need National Data?

Information means money

- GPRA is tied to budget requests
- Funding for special needs
  - Racial disparities
  - Diabetes
- ORYX and JCAHO accreditation

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Why Do We Need National Data?

National level data can improve clinical care

- Patient safety

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Why Do We Need National Data?

Information provides program direction
- Needs assessment
- Resource allocation
- Outcome performance
- Facility planning

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How Do We Design Our National DB?

- We have conflicting needs.

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We Need More Data

The breadth of information needs is increasing
- Statistical
- ORYX
- Epidemiology
- Diabetes
- Pharmacy
- Cost management
- Bioterrorism

etc.

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We Need One, All-Inclusive Repository

One central collection point for all data
- Verify receipt of data
- Analyze and provide feedback on
  - Timeliness of data
  - Data quality
  - Unexpected deviations from historical norms
- Maintain a "single version of historical truth"
- Maintain all the information content of the data

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One, All-Inclusive Repository

- And one large information repository becomes too unwieldy for reporting

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We Need Focused, Efficient DBs

We need efficient, user friendly access to data

- Ease of user access
- Search-efficient DB structures
- Subsets of data – just what we need for specific uses
- Transformed data

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Focused, Efficient Data Marts

But data marts alone just cannot maintain the

- Flexibility
- Granularity
- Scalability
- Power

that will be required to meet all needs now or in the future

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We Must Accommodate Growth

And the architecture has to be able to accommodate change.

There will be future needs for information that even the most astute among us cannot now anticipate.

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We Need Both…

We need one, large, replete, and powerful data warehouse,

that provides information to more focused, user-friendly, efficient data marts.

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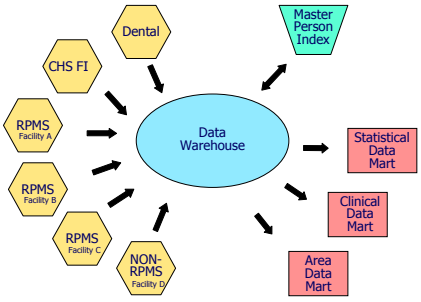
National DW Environment



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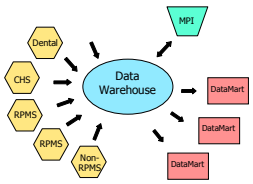
The DW Environment Will



- Be designed to take advantage of the latest in technologies and design features

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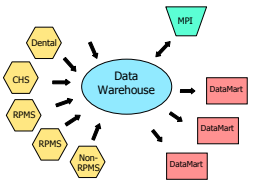
The DW Environment Will



- Collect and store information exactly as it is received from the field

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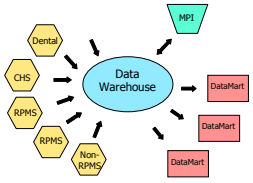
The DW Environment Will



- Provide accurate and intelligent information about the data it receives:
  - Record counts
  - Timeliness of data
  - Less than expected counts based on historical benchmarks
  - Missing data in fields, erroneous codes

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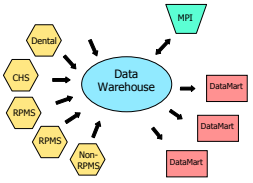
The DW Environment Will



- Supply data to various data marts from which more targeted information can be gathered
  - Statistical - workload and user pop reports
  - Clinical – GPRA, ORYX, Epidemiology
  - Area
  - Pharmacy

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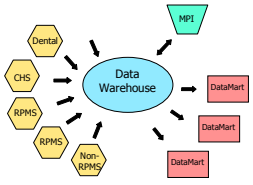
The DW Environment Will



- Employ a Master Person Index (MPI), when available

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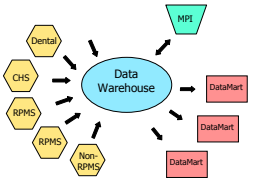
The DW Environment Will



- Employ healthcare industry standards for data transport and messaging

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PDW: Phase 1

- Three Areas - Albuquerque, Nashville, Phoenix
- RPMS and non-RPMS sites
- Data from FY 97 to present
- Large spectrum of data content
- Working with experts from IBM and SAS

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PDW: Phase 1

- Designed to gather and store as much granularity as possible
- Minimal data cleansing and data transformation between staging and DW tables
- No unduplication of visit records *yet* if they come from different sources
- Store all modified, deleted records, flagging the current snapshot

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PDW: Phase 1

- Exploring data in PDW will determine which data transformations should be hard-coded in DW-1 and where
- Vying priorities
  - Creating one single "version of truth" for all DMs
    - Consistency
    - Efficiency
  - Data mart specific transformations

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PDW Status

- Logical and physical models complete
- Load status
  - ✓ Registration data
  - ✓ PCC encounter data
  - ✓ CHS Fiscal Intermediary data
  - ✓ CHS 638 (non-FI) data
  - ✓ Dental data

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Testing PDW

- Producing Workload and User Pop Reports
- Performing several clinical outcome measures
- Field content reports
- Deviation from historical norm reports
- Exploring
  - Unduplication methods
    - Patients
    - Visits
  - Handling of receipt of updated records
  - Storing non-uniform data
  - Modeling complex multi-hierarchical and non-hierarchical relationships

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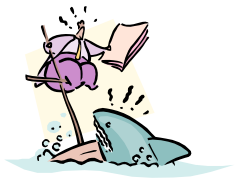
The Dilemma…



- We need a complete, all-inclusive solution and we needed it yesterday
- But to plan, build, and implement a complete solution would take far, far too long and would not deliver incremental value to our users along the way

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The Solution

- Build the data warehouse environment in increments that deliver value to users at each step
- The most critical user needs will be addressed first

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DW-1

- Extend PDW system-wide
- Export enhancements
- Provide information to data sources about data receipt, integrity, and quality
- Implement a clinical and statistical data mart
- Provide user access to data marts
- Gather and document metadata

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Extend PDW System-Wide

- Enhance PDW architecture and processes to improve performance and functionality and support future expansion
- Adapt PDW models to accommodate limited number of additional data elements and different entity relationships
- Enhance data cleansing and transformation routines based on what we learned from PDW

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Extend PDW System-Wide

- Key issue: scalability

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Export Enhancements

- HL7 based export from RPMS sites
- Unified RPMS registration/encounter export
- Utilize Interface Engine

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Data Integrity and Quality

- Provide information to data sources
  - Export tracking
  - Error checking
  - Data quality
- Combine elements of
  - ORYX data tracking system
  - PDW web-based reports
  - PCC encounter export monitoring project

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Data Marts

- Two initial data marts
  - Statistical – "son of NPIRS"
  - Clinical – "daughter of ORYX"
- Near future data marts
  - Data quality
  - Pharmacy
- Not quite as "near future"
  - Area
  - Dental

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User Access

- Secure, ad hoc access for authorized users to appropriate data marts
- Awaiting approval for draft guidance on access and use of data

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The Future for Data Marts

- Data Marts will multiply and ultimately be planned, built, and maintained by programs rather than IT
- Information and the ability to derive useful knowledge from it will become even more critical to our survival

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Metadata

- Data about data
- Collected and stored in DB2 Warehouse Manager
- Eventually part of a central metadata repository

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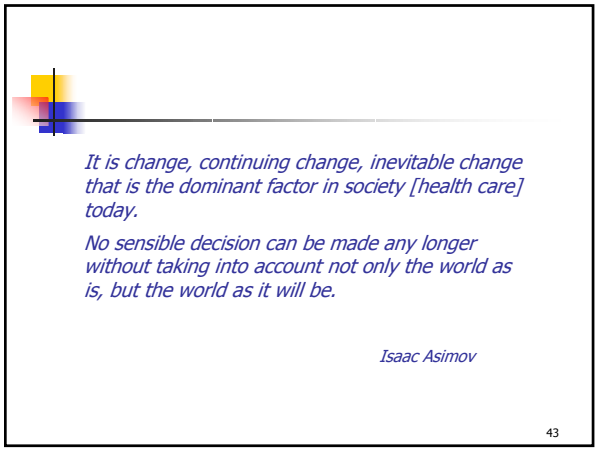
It is change, continuing change, inevitable change that is the dominant factor in society [health care] today.
No sensible decision can be made any longer without taking into account not only the world as is, but the world as it will be.
Isaac Asimov
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